Rivet, W.

A NEW

CHRONOLOGICAL TABLE,

CONSTRUCTED FROM THE

Mean Quantity of a Tropical Solar Year.

ON reading the Critical Review for June 1763, I was concerned to ſee an ingenious Author attacked, for preſuming to make uſe of a different quantity of the ſolar year, from what has been aſſigned by ſome late aſtronomers.

This engaged me to peruſe the work itſelf, which is purely on the ſubject of chronology, and wholly independent of aſtronomical calculation, the Author having confined his computations within the compaſs of common arithmetic.

It is true, he has taken his epoch from the noon of Thurſday the 25th of October, anno 706 of the Julian period, being the 298th day incluſive from the kalends of January, at which inſtant the ſun is ſuppoſed to have entered libra, in a meridian that lies 156 degrees to the weſtward of Greenwich, or 10 h. 24 min. later in time.

By this commencement, the reverend Author makes the world four years older than archbiſhop Uſher has computed it, who dates his chronology from the autumn of the 110th year of the Julian period; but if we calculate by his æra, we can never obtain the true week-day on which the equinox falls in any year.

The

The quantity he has aſſumed for the mean length of a ſolar tropical year, is the ſame that was uſed by many ancient Aſtronomers, viz. 365 d. 5 h. 49 min. and I have been induced to calculate thereby, on the following accounts.

Becauſe I find the equinox falls, in every ſucceeding year, as much later in time as the tropical year exceeds the Egyptian, (to wit) exactly 5 h. 49 min.

And for that, Tycho Brahe, and many others, have, from their obſervations, given us ſeveral ſucceſſive years of the ſame determinate length; which ſeems alſo confirmed by our time-pieces agreeing with the equation tables, which otherwiſe would require an annual alteration.

Alſo, becauſe this quantity will perfectly meaſure all periods of time; and if I compute any interval thereby, I find the celeſtial appearances agree with the calculations: nor do I ever fail in the concluſion, of obtaining the cycle of the year, and dominical letter, in exact correſpondence with the Julian period.

But as I had frequent occaſion, while I was examining the book, to know the true time of the autumnal equinox, and the Author's way of computing was rather too prolix, I conſtructed the following table; whereby I gain the day of the week, hour, and minute of the ſun's entrance into libra, in the aforeſaid meridian, in any given year.

And I get the day of the month by ſubſtracting the Julian exceſs * (in days only) from the epoch, (to wit) either from 298, or 297, as the caſe is; for, in a biſſextile year, and the next following, unleſs it be the laſt of a period, the 297th day is the epoch.

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* *Note*, The Julian exceſs is 11 minutes per annum, and 11 days in a period of 1440 years; wherefore, multiply any interval of years by 11 minutes, then divide the product by 1440, and the quotient will yield the number of days to be ſubſtracted.

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The TABLE.

Years.	D.	H.	M.	Yrs.	D.	H.	M.
9000	2	6	0	90	6	19	30
8000	5	21	20	80	1	9	20
7000	2	12	40	70	2	23	10
6000	6	4	0	60	4	13	0
5000	2	19	20	50	6	2	50
4000	6	10	40	40	0	16	40
3000	3	2	0	30	2	6	30
2000	6	17	20	20	3	20	20
1000	3	8	40	10	5	10	10
900	5	3	0	9	4	4	21
800	6	21	20	8	2	22	32
700	1	15	40	7	1	16	43
600	3	10	0	6	0	10	54
500	5	4	20	5	6	5	5
400	6	22	40	4	4	23	16
300	1	17	0	3	3	17	27
200	3	11	20	2	2	11	38
100	5	5	40	1	1	5	49

The ſecond column ſhews the week-day of the equinox, counting from Thurſday, which is 0; therefore 1 is Friday, 2 Saturday, 3 Sunday, and ſo on to 6, which is Wedneſday; and the third column contains the hours and minutes, reckoned from noon.

In caſting up the days, entire weeks are to be rejected.

Q. *The day of the autumnal equinox in the year of our Lord 325, the firſt after biſſextile?*

Extract from the Table.

Years.		D.	H.	M.
4000	-	6	10	40
300	-	1	17	0
30	-	2	6	30
2	-	2	11	38
Tueſday		5	21	48

Epoch - 297
Julian exceſs - 33
264 days
Subſtract for Aug. 243
In libra, Tueſday, Sept. 21 21 48
Add for Greenwich 10 24
22 8 12

4713
325
5038
706
Interval 4332

To find the vernal equinox in the ſame year, ſubſtract the meridian diſtance between aries and libra.

Sun in libra - - - -	265	8	12	
Subſtract - - - -	186	11	51	
	78	20	21	
Subſtract for Feb. -	59			
Friday, March	19	20	21	in aries.

Q. *The autumnal equinox A. D.* 1763, *new ſtyle?*

Years.	D.	H.	M.
5000 -	2	19	20
700 -	1	15	40
70 -	2	23	10
Thurſday	0	10	10

Epoch -	298			
Julian exceſs -	33			
	265	days		
Subſtract for Aug.	243			
	22	10	10	
Add for Greenwich		10	24	
In libra, Thurſday, Sept.	22	20	34	

4713	6476
1763	706
6476	5770

September 22 being Thurſday, the dominical letter is B, and it being the third year after biſſextile, the cycle of the ſun muſt be 8.

The writer of the aforementioned remarks in the Critical Review ſays, that all aſtronomers would be thankful if they could find any thing whereby to correct their tables, ſince none of them do aſſert that they are quite perfect. I would therefore recommend the table above inſerted, which will always give them the true time of the autumnal equinox; and, if they know their meridian diſtances, they may be equally certain with reſpect to the other cardinal points.

But if our Author's mean quantity ſhould not anſwer the purpoſes of aſtronomy as effectually as the ſolar tables with equations, yet it will be ſufficient for chronological uſe, which is the only application he makes of it; and I humbly conceive he might have expected a more candid reception.

W. RIVET.